

Application No. 10/589,698  
Amendment dated December 2, 2010  
Reply to Final Office Action of September 14, 2010

AMENDMENTS TO THE CLAIMS:

1. (Currently amended) A method for manufacturing at least one plate ~~stacks~~ stack, for the production of coolers or cooler elements ~~or heat sinks comprising at least one plate stack~~ for cooling electric ~~and/or~~ opto-electric components, wherein the method comprises ~~at least~~ the following process steps:

manufacture of plates ~~or boards~~ of ~~metal~~ copper,

stacking of the plates to form a the at least one plate stack,

joining of the plates with an application of heat at a joining temperature (TF) between 1065°C and 1082°C and at an atmospheric pressure ~~or in a vacuum~~ in a joining or bonding process step by direct copper bonding to form a bonded plate stack,

cooling of the bonded plate stack ~~formed by the joined plates~~ to a temperature below the joining temperature (TF); and

placing of the bonded plate stack into a chamber for a post-treatment; and a hot isostatic pressing post-treatment ~~(HIP treatment)~~ of the bonded plate stack inside the chamber in an inert gas atmosphere at an inert gas pressure (PB) between 200 and 2000 bar, and at a post-treatment temperature (TB) that is below the joining temperature (TF).

2. (Previously presented) The method according to claim 1, wherein the post-treatment temperature (TB) is approximately 95 to 99% of the joining temperature (TF).

Application No. 10/589,698  
Amendment dated December 2, 2010  
Reply to Final Office Action of September 14, 2010

3. (Previously presented) The method according to claim 1, wherein the post-treatment temperature (TB) is at least 50% of the joining temperature (TF).

4. (Currently Amended) The method according to claim 1, wherein post-treatment of the plate stack in an inert gas atmosphere is conducted at a gas pressure between 200 and 2000 bar, and at a post-treatment ~~treatment~~ temperature (TB) corresponding to approximately 50 – 99% of the joining temperature (TF) at which all metal components of a system forming a joining connection have solidified.

5. (Currently amended) The method according to claim 1, wherein post-treatment of the plate stack is conducted in an inert gas atmosphere at a gas pressure between 200 and 2000 bar, and at a post-treatment ~~treatment~~ temperature (TB) corresponding to approximately 50 – 99% of the joining temperature (TF) at which all components of a brazing metal forming a joining connection have solidified.

6. -7. (Cancelled)

8. (Currently Amended) The method according to claim 1, wherein during the ~~HIP~~ post-treatment, an inert gas atmosphere formed by argon or nitrogen with a maximum oxygen

Application No. 10/589,698  
Amendment dated December 2, 2010  
Reply to Final Office Action of September 14, 2010

content is used that amounts to approximately 300% of an oxygen content corresponding to an equilibrium oxygen partial pressure at the post-treatment temperature (TB).

9. (Previously presented) The method according to claim 8, wherein the oxygen content in the inert gas atmosphere is less than an oxygen partial pressure of  $15 \times 10^{-6}$  bar.

10. (Currently amended) The method according to claim 1, further comprising the following process steps:

application or creation of a copper-oxide layer as joining material on the plates made of metal,

heating of the plates after stacking to a temperature between 1065 and 1083 $\pm$ 2°C, and

HIP post-treatment of the plate stack at a pressure between 200 and 2000 bar, and at a post-treatment temperature of at least 390°C and no more than 1052°C.

11. (Currently amended) The method according to claim 1, further comprising the following process steps:

application or creation of a copper-oxide layer as joining material on the plates made of metal, and

Application No. 10/589,698  
Amendment dated December 2, 2010  
Reply to Final Office Action of September 14, 2010

heating of the plates after stacking to a temperature of 1065°C and ~~HIP~~ post-treatment of the plate stack at a pressure of 1000 bar at a post-treatment temperature of 1020°C.

12. (Previously presented) The method according to claim 1, wherein the joining of the plates takes place with the application of heat at a mechanic pressing force between 20 and 2500 bar.

13.-17. (Cancelled)

18. (Previously presented) The method according to claim 1, wherein a joining material is applied to surfaces of at least some openings.

19. (Cancelled)